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THE BRITISH SPECIES OF *TASIOCERA* SKUSE (DIPTERA, TIPULIDAE).

By Paul Freeman, M.Sc.

(*Department of Entomology, British Museum (Natural History).*)

Only one species of *Tasiocera* Skuse has previously been recorded from Britain, the well known *T. murina* Meigen, usually placed in the sub-genus *Dasymolophilus* Goetghebuer (Edwards, 1938, gives Tonnoir as the author, in error). *Dasymolophilus* was originally considered to be a sub-genus of *Molophilus*, but Alexander (1928 and 1934) and Edwards (1938) showed it to be more closely allied to the tropical genus *Tasiocera* Skuse. It is accordingly now considered to be a sub-genus of *Tasiocera*.

Dasymolophilus is readily separable from *Molophilus* by the simple male styles and the presence of hairs on the postnotum; these and other characters place it in *Tasiocera*. It is separable from *Tasiocera sens. str.* by the presence of long hairs (macrotrichia) on the wing membrane and by the first sub-marginal cell (cell R_2) being longer than the second (cell R_3).

Alexander has described a species from Formosa, *T. nokoensis*, placed in the sub-genus *Dasymolophilus*, which has very few macrotrichia on the wing membrane, and the same is true of *T. jenkinsoni* sp. n.; *T. collini* and *T. laminata* spp. n. show an intermediate condition, whilst *T. murina* and *fuscescens* Lackschewitz have plenty of hairs in practically all cells. The other character separating the two sub-genera, the length of the second submarginal cell, does not apply to some undescribed species of *Tasiocera* collected by F. W. Edwards in Uganda (Ruwenzori Range). The female abdomen of at least some of the British species carries brushes of curiously shaped hairs, described below under *T. collini*. These brushes have not been noted before in any species, so far as I can discover, but they are present in one of the Uganda species mentioned above.

Taking these points into consideration it seems reasonable to say that the differences between the two sub-genera are not as great as was at first thought and are not sufficient to warrant splitting the genus. I am therefore regarding *Dasymolophilus* Goetghebuer as a synonym of *Tasiocera* Skuse.

There are five species of *Tasiocera* known from the Palaearctic Region: *T. murina* Meigen, *T. fuscescens* Lackschewitz from Albania, and three species, *T. kibunensis*, *nokoensis* and *jubatus*, described by Alexander from Japan and Formosa. The species described here include *T. murina*, *fuscescens* and three new ones. They are best separated by the structure of the male hypopygium, but there are also characters present in the numbers of macrotrichia on the wing membrane and in the arrangement of the cross veins. These latter characters are useful for certain species, but not for all and may be subject to greater variation than I have indicated.

The male hypopygium is of the inverse type. The coxites are comparatively simple and so are the styles; the aedeagus is formed of two parts—the sternal (actually dorsal) median penis and the tergal (actually ventral) " phal-

losomic structure." The phallosomic structure often bears teeth and offers the best specific characters ; it is attached to the coxites and is single and median in three species, but deeply bifid and practically paired in *T. fuscescens* and *jenkinsoni*.

Females are scarce. Out of 71 specimens examined only 8 are females. With this limited material I have not been able accurately to identify females, but I have tentatively described what I consider to be the females of three of the species, two of them carrying the peculiar hair brushes on the abdomen. No doubt when the habits of the females are discovered many more specimens will become available.

I wish to thank Mr. J. E. Collin for drawing my attention to the complex nature of the British species and for lending me material from his collection ; he has very kindly presented the types of two of the species to the British Museum. The type of the third new species has been presented to the Museum by the Cambridge University Museum.

Key to British Species of *Tasiocera* Skuse.

1. Wing membrane with numerous long macrotrichia, most cells with 2–3 rows along the centre, portion of cell R_1 basal to radial cross vein with about 50 . . . . . 2.
   Wing membrane with macrotrichia greatly reduced in number, if the cells between the long veins carry any, they are either sporadic or at the most in a single row, portion of cell R_1 basal to the radial cross vein with 20–30 . . . . . 3.
2. Male hypopygium as in figs. 2*a*, *b*, *e*, phallosomic structure simple, style with three or four teeth ; radial cross vein opposite base of R_2 (fig. 1*a*) *murina* Meigen.
   Male hypopygium as in figs. 3*a*, *b*, phallosomic structure deeply bifid, style untoothed, tapering to a very fine point ; radial cross vein more distal (fig. 1*d*) . . . . . *fuscescens* Lackschewitz.
3. Radial cross vein in same straight line as R_2, medio-cubital cross vein distal to fork of media (fig. 1*c*) ; male hypopygium with forked style and bifid phallosomic structure (figs. 3*c*, *d*, *e*) . . . . *jenkinsoni* sp. n.
   Wing venation and male hypopygium different . . . . . 4.
4. Cells M and M_4 lacking macrotrichia ; venation as in *murina* (fig. 1*a*) ; aedeagus as in fig. 2*f*, penis broadened and concave in sternal aspect *collini* sp. n.
   Cells M and M_4 with a single row of macrotrichia ; venation as in fig. 1*c* ; aedeagus as in fig. 2*g*, penis compressed, blade-like . *laminata* sp. n.

Tasiocera murina Meigen.

Erioptera murina Meigen, 1818, *Syst. Beschr.* **1** : 113.
Erioptera pygmaea Macquart, 1826, *Recueil Soc. Sci. Agricult. Lille* : 165.
Molophilus murinus de Meijere, 1920, *Tijdschr. Ent.* **53** : 67.
Molophilus (*Dasymolophilus*) *murinus* Goetghebuer et Tonnoir, 1920, *Bull. Soc. ent. Belg.* **2** : 132.
Dasymolophilus murinus Alexander, 1936, *Philipp. J. Sci.* **60** : 200–1.
Tasiocera (*Dasymolophilus*) *murina* Edwards, 1938, *Trans. Soc. Brit. Ent.* **5** : 151.
Molophilus (*Dasymolophilus*) *murinus* Lackschewitz, 1939, *Ann. naturh. Mus. Wien* **50** : 14.
Tasiocera (*Dasymolophilus*) *murina* Coe, 1950, *Handb. Ident. Brit. Ins.* **9** (2) : 66.

A very small, very hairy, dark brown crane-fly ; wing membrane with numerous long macrotrichia ; halteres blackish ; male hypopygium characteristic, phallosomic structure single, rather foot-like in lateral aspect with several rows of teeth on the tergal surface.

Male.—Wing length 2·5–3·5 mm.

Colour.—Fairly uniformly dark brown, sometimes blackish. Halteres blackish, pale at extreme base.

Pubescence.—Entire insect covered with long brown hairs, legs with some outstanding hairs, but most of their pubescence is adpressed.

Wings.—All veins clothed with long macrotrichia. Macrotrichia present on membrane

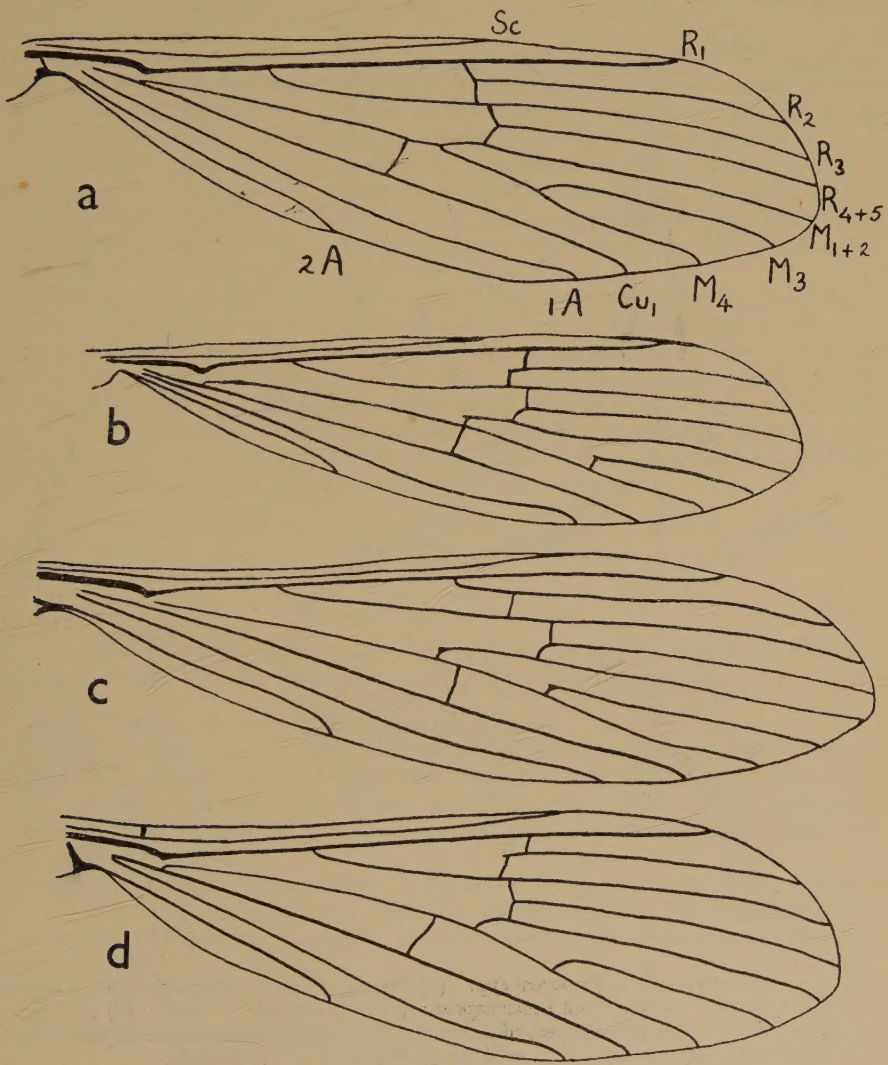

FIG. 1.—Wings of *Tasiocera* spp. (a) *T. murina*; (b) *T. laminata*; (c) *T. jenkinsoni*; (d) *T. fuscescens.*

in all cells except cell Sc; in distal long cells present as a central double or treble row, in more basal cells more generally scattered, numerous in cells R, M, Cu. Venation as in fig. 1*a*; radial cross vein opposite base of R_2; cell R_2 longer than cell R_3.

Hypopygium (figs. 2*a*, *b*, *e*).—Coxites conical, styles curved, with a pointed apex and

about 4 subapical teeth ; penis in lateral aspect narrow and strongly bent, not heavily sclerotised ; phallosomic structure single, broad, slightly foot-like with several rows of short teeth on the tergal surface.

Female.—Resembles the male.

Abdomen.—If the sexes have been correctly recognized then the female abdomen is simple without the hair brushes of *collini* sp. n. Ovipositor perhaps longer and less strongly curved than *collini*.

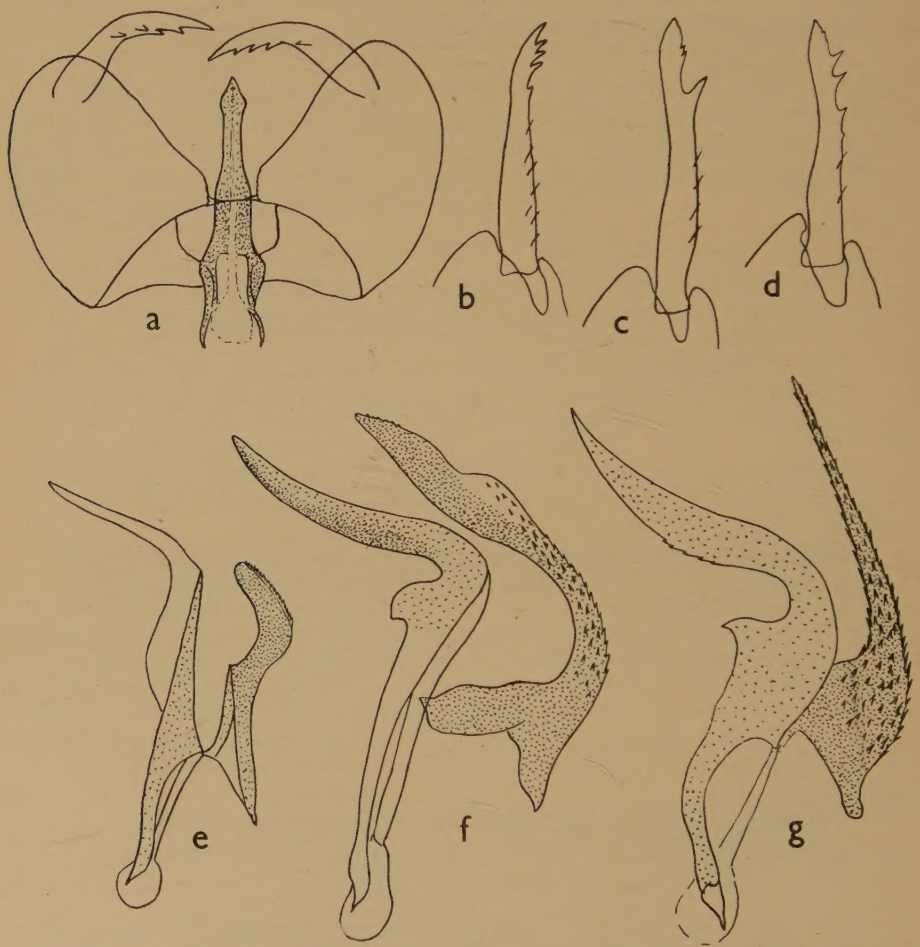

Fig. 2.—Male hypopygia of *Tasiocera* spp. (*a*) Sternal aspect of hypopygium of *T. murina* ; (*b*) style of *T. murina* from inner aspect ; (*c*) the same of *T. collini* ; (*d*) the same of *T. laminata* ; (*e*) lateral aspect of aedeagus of *T. murina*, magnification greater, penis to the left ; (f) the same of *T. collini* ; (*g*) the same of *T. laminata*.

I am following the accepted interpretation of Meigen's name. Edwards (1938) points out that the specimen under this name in Meigen's collection is not of this species, but is of a species of *Molophilus*. However, the colour of the halteres is not black as in the description and so it is probably not the specimen from which the original description was made.

Distribution.—Common ; specimens seen from Sutherland, Ross and Cro-

marty, Inverness-shire, Banffshire, Arran, Hertfordshire, Hampshire, Somerset, Kerry.

Tasiocera collini sp. n.

A dark species, distinguished from *T. murina* by the reduced number of macrotrichia on the wing membrane and by the structure of the male hypopygium ; female abdomen with modified hair brushes.

Male.—Wing length 2·5–3·5 mm.

Wings.—Venation as in *T. murina*. Macrotrichia present on veins, but practically absent from the wing membrane, reduced to a single row in the portion of cell R distal to radial cross vein and to about 30 in the portion basal to this cross vein all being in the anterior half of the cell ; when present in other cells, then isolated and sporadic.

Hypopygium.—Style with one strong tooth near the apex (fig. 2*c*) and 2–3 small ones between it and the apex, which is quite broad ; penis broad, concave on ventral surface, shaped as in fig. 2*f*, quite strongly sclerotized ; phallosomic structure single, blade-like at apex, but compressed laterally, strongly sclerotized, stem rounded and armed with teeth.

Female.—In general resembles male, except for abdomen.

Abdomen.—Females taken at the same time and place as males have brushes of modified hairs on tergites 6 and 7 (fig. 4*a*). Each hair of the brush is long and bent over at right angles at the apex ; the bent over portion is broadened and translucent, the margin of the broadening is irregularly toothed, the apex is drawn out, and there are radial lines—possibly thickenings (figs. 4*b*, *c*). The flattened apices lie all together at right angles to the main hair brush. Seen from above the brushes appear golden, but seen from the end they appear brilliant white because of the light reflected from the superimposed flattened portions. Ovipositor perhaps thicker and more bent than in other species.

Holotype, male, and paratypes, 9 males, 2 females, Suffolk, Chippenham Fen, 25.vii.50 (*J. E. Collin*). Found in numbers on poplar tree trunk.

Tasiocera laminata sp. n.

Separable from the other species by the arrangement of macrotrichia on the wing membrane, by the venation, and by the male hypopygium.

Male.—Wing length 3·0 mm. (one specimen).

Wings.—Venation (fig. 1*b*) quite similar to that of *T. murina* but the radial cross vein is placed more apically and the mediocubital cross vein is opposite the fork of M—these may be variable characters. Macrotrichia present on membrane as a single row in cells R (apical portion), M, and Cu, and all over surface of basal portion of cell R, presence in other cells only sporadic.

Hypopygium.—Style rather similar to that of *collini*, but 2–3 large teeth near apex (fig. 2*d*) ; penis laterally compressed, blade-like, pointed at the tip (fig. 2*g*) ; phallosomic structure broad in tergal aspect, toothed, giving a serrated edge, dorso-ventrally flattened, appearing narrow in side view.

Female.—Not known.

Holotype, male, Cambridge, Woodditton Wood, 1.viii.44 (*J. E. Collin*).

Tasiocera fuscescens Lackschewitz.

Molophilus (*Dasymolophilus*) *fuscescens* Lackschewitz, 1939, *Ann. naturh. Mus. Wien* **50** : 14.

Separable from the other species by radial cross vein being more distal, wing membrane with numerous macrotrichia, male hypopygium with characteristic styles and deeply bifid phallosomic structure.

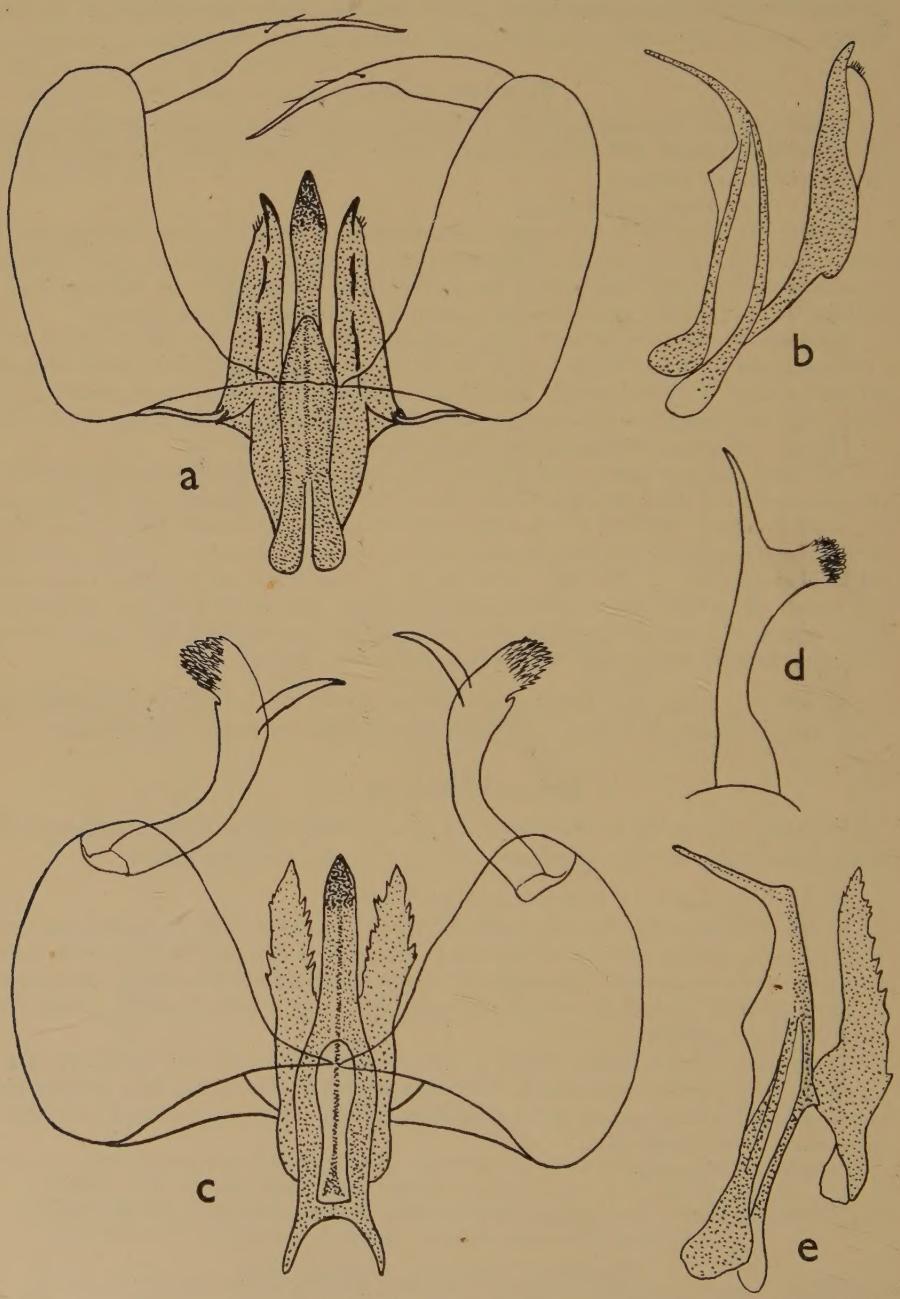

FIG. 3.—Male hypopygia of *Tasiocera* spp. (*a*) Sternal aspect of hypopygium of *T. fuscescens*; (*b*) aedeagus of *T. fuscescens* in lateral aspect, penis to the left; (*c*) sternal aspect of *T. jenkinsoni*; (*d*) lateral aspect of style of *T. jenkinsoni*; (*e*) lateral aspect of aedeagus of the same.

Male.—Wing length 3–4 mm.

Wings.—Venation (fig. 1*d*) differs from that of *T. murina* by the more apical position of the radial cross vein, and from *T. laminata* by the shorter base of M_{1+2}, so that the mediocubital cross vein is not opposite the fork of M—these characters may be variable. Macrotrichia numerous in all cells, arrangement similar to that of *murina*.

Hypopygium.—Coxites (fig. 3*a*) rather long, styles quite characteristic, gently curved, broad basally, rather sharply narrowing less than half-way along, and then tapering gradually to the finely pointed tip ; penis (fig. 3*b*) smoothly bent ; phallosomic structure deeply bifid, almost paired (fig. 3*a*), bluntly pointed, laterally with a thinner extension.

Female.—Resembles male except for the abdomen.

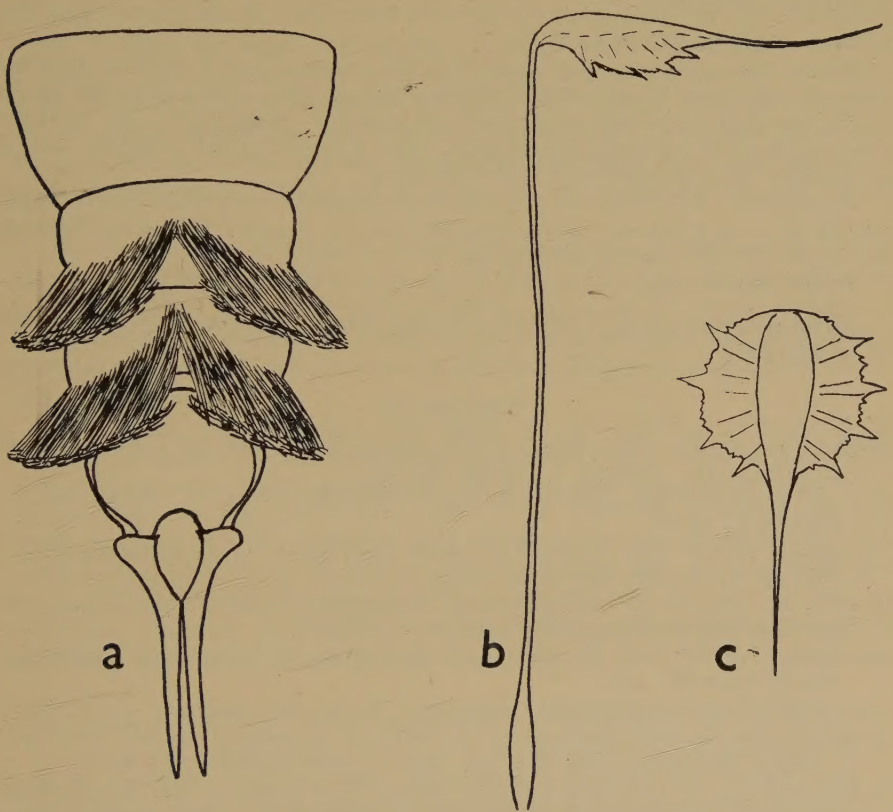

FIG. 4.—*Tasiocera collini*, female abdomen. (*a*) End of abdomen showing specialized hair brushes ; (*b*) an isolated hair from brush under high power ; (*c*) terminal view of single hair to show broadened apex.

Abdomen.—If the sexes have been correctly associated then specialized hair brushes present on segments 6 and 7 exactly as in *T. collini* except that the individual hairs are rather shorter and the flattened apices of the hairs appear not be toothed, but this requires confirmation.

This species is readily recognized as the same as was described by Lackschewitz from Albanian material because his figure shows well the shape of the styles and the bifid nature of the phallosomic structure. In hypopygial structure it comes closest to *T. jenkinsoni* sp. n., but in the arrangement of the

macrotrichia on the wing membrane it is nearest to *murina*. It is probable that the male genital character is of more phylogenetic significance.

Distribution.—Specimens in B.M. from Arran, Brodick (*F. W. Edwards*) and Kent, Tunbridge Wells (*Verrall*). Specimens in collection of Mr. J. E. Collin from Midlothian, Polton and Cambridge, Woodditton Wood.

Tasiocera jenkinsoni sp. n.

Similar to the other species in general appearance, readily separable by wing venation, arrangement of macrotrichia on wing membrane and by male hypopygial characters.

Male.—Wing length 3–3·5 mm.

Wings.—Membrane with very few macrotrichia, portion of cell R basal to the radial cross vein with about 12 only, all in the anterior part, no other areas with regular macrotrichia, any that are present are scattered and sporadic. Venation as in fig. 1*c*, radial cross vein long and continuing the line of R_2, base of anterior branch of M long, making mediocubital cross vein distal to the point of forking.

Hypopygium.—Style forked (figs. 3*c*, *d*), tergal branch thin and pointed, sternal broad, covered at the apex with short teeth; penis sharply bent (fig. 3*e*); phallosomic structure deeply bifid with irregular toothed outline.

Female.—Not known.

Holotype, male, and paratypes, 2 males, Sussex, Crowborough, 14.viii.06 (*F. Jenkinson*).

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APHIS VACCINII (BÖRNER) (HEMIPTERA, APHIDIDAE) NEW TO THE BRITISH ISLES. A REDESCRIPTION AND COMPARISON WITH *APHIS CALLUNAE* THEOBALD.

By J. H. Fidler, M.A., Ph.D.

(*National Agricultural Advisory Service, Ministry of Agriculture and Fisheries, Leeds.*)

In July of 1949 Mr. W. Bell asked the writer to examine a few apterous aphids found on some seedlings of Blueberry (*Vaccinium vacillans* Kalm.) at Otley, Yorkshire. After mounting, these specimens seemed to fit the description given by Theobald (3) for *Aphis callunae*. On further examination of the plants early in September some alatae were found and these were sent to Mr. H. L. G. Stroyan, who expressed the opinion that they were *Aphis vaccinii*, a species described by Börner (1) in 1940 and not previously recorded in this country.

On examination of Börner's very brief description it was noted that he recorded *Andromeda polifolia* L. as one of the host plants. The present writer recalled another Yorkshire record of aphids taken by Mr. A. A. Dallman on this plant and which Mr. F. Laing (2) had examined and had provisionally assigned to *Aphis callunae*, but noting that they differed in a number of characters from this species.

The writer was given the opportunity by Mr. Laing of examining this material and it was found, although showing considerable variation in sclerotization in the apterae, to be undoubtedly the same species as that found at Otley. Comparison was also made with slides of *A. callunae*, including the Type specimen, and it was concluded that the two species, although very close, differed in a number of characters unlisted in both Börner's and Theobald's descriptions. It was, therefore, decided that a redescription of *A. vaccinii* was called for, especially as Börner's description of the apterae consists of about a dozen words and the alatae of neither species appear to have been noted before.

Apterous viviparous ♀ (from *Vaccinium*). Morphology of cleared specimen.

Body oval; cuticular reticulation more or less distinct; sclerotic pattern very variable; minimum having a marked transverse bar on the 8th segment and a lesser one on the 7th; a medium sized postsiphuncular sclerite, and one antesiphuncular at least in the form of a scleroite; six small marginal scleroites each side; there are usually larger marginal sclerites on the meso- and meta-thorax. Maximum sclerotic pattern (from *Andromeda*)—the marginal sclerites are much larger, with intermediate scleroites; spinal scleroites also present, often fused into larger patches and transverse bars, especially on the 1st and 6th abdominal segments; the thoracic sclerites extend right across the segments. A few scattered hairs on abdominal tergites, about 1–1½ times as long as base of ant. seg. III. Transverse double row of hairs on each abdominal sternite; 2–3 lateral hairs on each abdominal segment 1½–2 times base of ant. III. Prominent lateral tubercles on the prothorax and smaller ones on the 1st and 7th abdominal segments; shape blunt and rounded.

Head smooth, with a few long hairs, including two large incurved ones on the frontal area which is rather convex with very slightly produced antennal tubercles. Antennae

about three-fifths length of body, imbricated, with a few scattered hairs in length about three-quarters of the basal width of ant. seg. III. Segment I larger and longer than II; V a little shorter than IV, together about equal to VI; processus terminalis $2\frac{1}{2}$–$3\frac{1}{4}$ times the base. Segment III and IV light in colour, as are the bases of V and VI. Secondary rhinaria usually absent. Rostrum long, reaching to or beyond third coxae; apical joint rather acuminate and a little longer than second joint of hind tarsi. Legs rather short, hind and mid femora and the tarsi and tips of tibiae dark; femora and tibiae with many long hairs; hairs on 1st tarsal joint 3 (2), 3, 2.

Siphunculi dark, strongly imbricated, cylindrical but very slightly enlarged at base; about 9 per cent. of body in length; slightly expanded to flange, which is not well marked.

Fig. 1.—*Aphis vaccinii* (Börner). Apterous viviparous ♀. Maximum sclerotic pattern.

Cauda dark, except at base, strongly imbricated, expanded at base and bluntly pointed at apex, about as long as siphunculi; 8–13 caudal hairs.

Colour of live specimen bluish-black with slight powdering of bluish meal.

Alate viviparous ♀ (from *Vaccinium*). Morphology of cleared specimens.

Cuticular reticulation obscure except at the caudal end. Sclerotic pattern of abdomen less variable than in apterae; large postsiphuncular sclerite and well marked semicircular antesiphuncular sclerite always present; also four large round marginal sclerites; transverse spinal sclerites on 7th and 8th segments and usually a small patch on the 6th; often small lightly marked scleroites between the marginal sclerites. Prothoracic tubercle obscure or wanting; abdominal tubercles as in apterae.

Frontal area less convex than in the apterae. Antennae nearly two-thirds length of body; segment I wider and of the same length as II; III larger than IV, which is slightly longer than V; VI about equal to IV and V together; processus terminalis three times the length of base. Secondary rhinaria on III 8–14, on IV 0–4; rhinaria round, of fairly regular size, irregularly scattered over whole length of segment, but mostly on one side. Wings light, with normal venation; the second fork of cubital vein usually nearer the margin of the wing than to the first fork.

Other characters similar to the apterae.

TABLE I.

Measurements and Proportions of Individual Apterae.

Specimen number.	Length of siphunculi % of body.	Caudal hairs.	Antennal segments. III.	IV.	V.	VI. base.	Flagellum.	Antenna/body length.	Body length in mm.
Aphis vaccinii.									
A	8·8	9	100	63	62	38	100	0·57	1·34
B	8·4	8	100	72	64	45	136	0·59	1·34
C	8·6	8	100	67	87	55	145	0·64	1·65
D	8·0	8	100	77	65	36	112	0·64	1·65
E	7·7	9	100	77	71	36	100	0·62	1·73
F	8·5	8	100	77	69	38	100	0·58	1·50
G	9·1	9	100	64	64	43	107	0·59	1·44
H	9·0	11	100	75	64	38	119	0·60	1·68
I	10·1	9	100	65	65	36	94	0·59	1·64
J	11·8	12	100	50	50	30	80	0·60	1·70
K	8·0	9	100	61	55	28	83	0·54	1·70
L	8·5	12	100	71	59	36	100	0·63	1·63
M	10·3	13	100	72	67	33	86	0·72	1·64
N	10·0	12	100	76	62	33	86	0·68	1·70
Aphis callunae.									
O	8·0	10	100	78	78	56	100	0·59	1·06
P	7·1	10	100	68	68	56	111	0·51	1·20
Q	8·0	10	100	78	68	56	100	0·59	1·05
R	6·6	7	100	63	63	50	112	0·55	1·07
S	5·7	9	100	60	70	50	120	0·58	1·17
Type	6·0	8	100	69	74	52	121	0·57	1·17

Comparison with *A. callunae* Theobald.

Superficially the two species are very alike, but *A. vaccinii* is a more heavily chitinized species than is *A. callunae*. It is also larger, with proportionally longer antennae and siphunculi. The main proportions of both species are given in Tables I and II, while Table III gives the characters in which the two species differ most markedly. The most obvious characters apart from the size, are the presence of the antesiphuncular sclerite in *A. vaccinii*, together with the longer flagellum and greater number of rhinaria on the antennal segment III in the alatae.

Fig. 2.—*Aphis vaccinii* (Börner). Alate viviparous ♀.

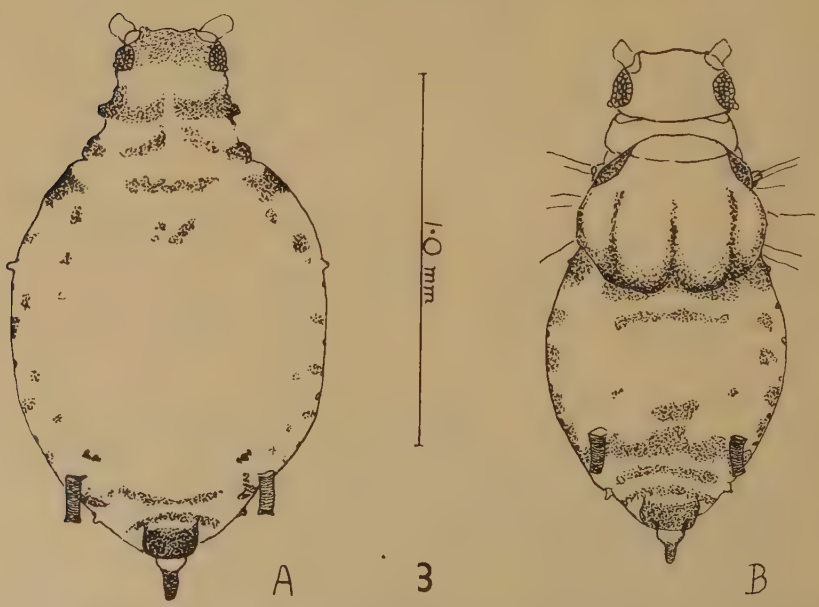

Fig. 3.—(A) *Aphis vaccinii* (Börner). Apterous viviparous ♀. Minimum sclerotic pattern.
(B) *Aphis callunae* Theob. Alate viviparous ♀.

Table II.

Measurements and Proportions of Individual Alatae.

Specimen number.	Length of siphunculi % of body.	Caudal hairs.	Rhinaria.		Antennal segments.					Antenna/body length.	Body length in mm.
			Seg. III.	Seg. IV.	III.	IV.	V.	VI base.	Flagellum.		
Aphis vaccinii.											
a	6·5	10	12,14	4,4	100	79	68	37	137	0·68	1·97
b	9·5	12	12,14	3,3	100	78	72	33	122	0·67	1·70
c	7·8	10	11,11	4,4	100	67	61	39	117	0·65	1·63
d	8·1	11	11,13	0,0	100	71	67	33	105	0·66	1·84
e	6·7	14	12,10	0,0	100	80	73	46	120	0·57	1·70
f	8·0	13	11,12	2,0	100	82	70	41	118	0·65	1·64
g	7·5	13	11,11	1,0	100	76	70	41	113	0·59	1·79
h	8·3	13	10,9	1,1	100	69	63	38	113	0·62	1·60
i	8·3	12	8,12	0,0	100	76	65	35	100	0·64	1·69
j	8·4	10	14,11	1,3	100	74	69	37	89	0·70	1·51
k	8·7	14	11,11	0,0	100	74	63	37	100	0·75	1·46
l	7·4	11	11,12	2,0	100	74	69	37	95	0·70	1·53
m	8·2	12	13,11	0,0	100	78	67	39	108	0·69	1·56
Aphis callunae.											
n	5·7	13	4,5	1,2	100	62	54	45	92	0·60	1·24
o	6·0	12	5,4	3,1	100	75	67	50	100	0·59	1·19

Table III.

Comparison with *A. callunae.*

Character.	*A. vaccinii.*	*A. callunae.*
Sclerotic pattern	Heavy to light	Almost absent
Bar on 7th tergite	Always present	Absent
Antesiphuncular sclerite	,, ,,	,,
Hairs on hind tibia	Long and many	Medium and few
Siphunculi	Cylindrical	Tapering
Cauda	,,	Knobbed
Marginal abdominal tubercles	Rounded	Pointed

	Character.	*A. vaccinii.*	*A. callunae.*
Apterae	Marginal prothoracic tubercle	Large	Small to absent
	Length of antennae as % of body	61 (54–72)	56 (51–59)
	Length of flagellum times base	2·96 (2·50–3·20)	1·98 (1·78–2·40)
	Length of siphunculi as % of body	9·1 (7·7–11·8)	6·6 (5·7–8·0)
	Length of body in mm.	1·60 (1·34–1·73)	1·12 (1·05–1·20)
Alatae	Rhinaria on ant. III	8–14	4–5
	Length of antennae as % of body	66 (57–75)	60
	Length of flagellum times base	2·99 (2·40–3·71)	2·01
	Length of siphunculi as % of body	8·0 (6·5–9·5)	5·9
	Length of body in mm.	1·66 (1·51–1·97)	1·21

Material Examined.

In the compilation of the present paper the following material has been examined :

Aphis vaccinii.

3 apterae (A C) on *Vaccinium vacillans* Kalm. Otley, Yorks, 27.vii.49 (*W. Bell*).

4 alatae (a–d) on *Vaccinium vacillans* Kalm. Otley, Yorks, 8.ix.49 (*J. H. Fidler*).

9 apterae (D–L) and 5 alatae (e–i) on *Andromeda polifolia* L. Thorne Waste, Yorks, 23.vii.32 (*A. A. Dallman*).

2 apterae (M–N) and 4 alatae (j–m) on *Vaccinium Myrtillus* L. Bennekom, Holland, 26.vi.49 (*H. L. G. Stroyan*).

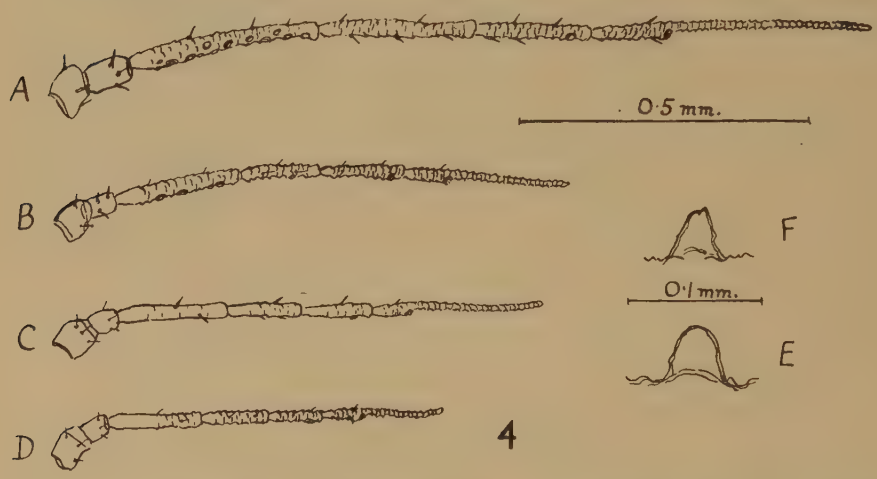

Fig. 4.—(A) *A. vaccinii*, alate viviparous ♀ antenna ; (B) *A. callunae*, ditto ; (C) *A. vaccinii*, apterous viviparous ♀ antenna ; (D) *A. callunae*, ditto ; (E) *A. vaccinii*, tubercle on 1st abdominal segment ; (F) *A. callunae*, ditto.

Aphis callunae.

4 apterae (O–R) and 2 alatae (n–o) on *Calluna vulgaris* Salisb. Bennekom, Holland, 24.vi.49 (*H. L. G. Stroyan*).

1 aptera (S) on *Calluna vulgaris* Salisb. Newlyn Downs, Cornwall, 21.viii.40 (*C. T. Gimingham*).

1 aptera (Type) on *Calluna vulgaris* Salisb. Brockenhurst, New Forest, Hants, 20.viii.15 (*F. V. Theobald*).

Biology.

All the *A. callunae* have apparently been taken on *Calluna vulgaris*. For *A. vaccinii* Börner records as host plants *Vaccinium uliginosum* L., *V. Myrtillus* L. and *Andromeda polifolia* L. To these the present writer's record adds *V. vacillans* Kalm. Dallman (2) records that he examined *Calluna* adjoining the colony on Thorne Waste in both 1932 and 1933, but was unable to find any *A. vaccinii* feeding on this plant. The aphid has been recorded feeding on *Vaccinium* from June to September and as the alatae taken by the writer in September appeared to be gynoparae, it would seem that the species is probably holocyclic on this plant.

ACKNOWLEDGMENTS.

The writer is indebted to Mr. H. W. Thompson for permission to complete this work and to Messrs. F. Laing and C. T. Gimingham for the loan of comparative material. Mr. H. L. G. Stroyan is also to be thanked not only for supplying material, but also for giving considerable help in preparing this paper.

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(1) BÖRNER, C., 1940, *Neue Blattläuse aus Mitteleuropa.* Arisodruck, Naumburg.
(2) DALLMAN, A. A., 1935, An aphid associated with *Andromeda polifolia* L. *Northw. Nat.* **10** : 263.
(3) THEOBALD, F. V., 1915, Notes on New and Little Known British Aphides. *Entomologist* **48** : 258–263.

BOOK NOTICE

The Ants of North America. By WILLIAM STEEL CREIGHTON. 8vo. *Bull. Mus. comp. Zool. Harvard,* **104.** 1950. Pp. 585, 57 pls. Price $10.00.

An extensive revision of the FORMICIDAE of America north of Mexico, based mainly on the Wheeler Collection. The arrangement is systematic, under the subfamilies PONERINAE, CERAPACHYINAE, DORYLINAE, PSEUDOMYRMINAE, MYRMICINAE, DOLICHODERINAE and FORMICINAE. Genera, species, and in some cases subspecies, are keyed, the keys referring only to workers and females, and males being omitted from consideration. The account of each species includes synonymy and references, type locality and location of types (if in United States; apparently those located in Europe were not traced), and range. Special care has been given to the latter to make it as informative as possible, short of listing the localities in detail.

CULEX (*CULEX*) *NAKURUENSIS* SP. N. (DIPTERA, CULICIDAE), A REMARKABLE NEW MOSQUITO FROM THE EAST AFRICAN HIGHLANDS.

By P. F. Mattingly.

(*British Museum* (*Natural History*).)

The holotype male of this very interesting species was presented to the British Museum by Mrs. E. C. C. Van Someren, who received it for identification from the hospital at Nakuru where it was collected. The description which follows is based on this specimen and on two paratype males from Subukia in the Nakuru district received on loan from the United States National Museum at Washington through the kindness of Dr. E. A. Chapin, Director of the Division of Insects, and Dr. Alan Stone of the Bureau of Insect Identification.

C. nakuruensis appears to be quite closely related to *Culex mirificus* Edwards (1913, 1941), which was found in the same area, but the male terminalia are even more remarkable. The highly complex style recalls the Ethiopian species of the sub-genus *Mocthogenes*, while the large patch of setae at the base of the coxite is unique among Old World *Culex* with the exception of *mirificus*, although characteristic of certain New World sub-genera. The very deeply divided apical lobe with its curious ornamentation strongly recalls the same New World sub-genera and is quite unique among the Old World species. The nearest approach among the latter is perhaps to be found in the sub-genus *Neoculex*. The paraprocts and 9th tergite are of the kind normally found in the typical sub-genus and, as the paraproct appears to afford the best sub-generic character in this group, no hesitation is felt in including this species with *mirificus* in *Culex* s. str.

Culex (Culex) nakuruensis sp. n.

Adult.—♂. *Head:* Palps exceeding the proboscis by about the length of the terminal joint, the last two segments upturned as is usual in the sub-genus, but less hairy than usual, much as in *mirificus*. Decumbent scales of vertex all narrow and pale, upright scales mostly dark. Tori and clypeus bare. Proboscis dark above, paler for most of its length below. *Mesonotum* with integument brown, with a median and two lateral dark stripes, covered with narrow reddish gold scales, the general effect being reddish. Dorso-central and acrostichal bristles well developed. Pre-scutellar area and scutellum with narrow pale scales. *Pleurae* pale. Lower mesepimeron with a single bristle. No post-spiracular or pre-alar scales. Sternopleural scale patch small. Upper and lower mesepimeral patches well developed. *Halteres* pale creamy except for a blackish patch on the upper surface of the knob. *Wings* all dark, wing scales narrow. Fork of vein 2 about 3 × as long as its stem. 7th (anal) vein at most faintly indicated. *Legs* dark except for the femora, which are pale behind and below almost to the tip. In the case of the hind femur the pale scaling extends on to the anterior surface, where it forms a pale ventral stripe. First segment of hind tarsus slightly shorter than tibia. Fore claws large, strongly toothed, unequal. Pulvillus well developed. Terminal segments of mid legs missing. Hind claws small, equal, simple, pulvillus well developed. *Abdomen* with tergites dark except for small basal lateral patches faintly indicated on the 6th and 7th. Sternites pale with dark patches in the mid-line and, in some cases, in the apical corners as in the *pipiens* group.

Terminalia (fig. 1).—Style showing an extreme form of the type of modification found in the *Neoculex* group of sub-genera, particularly *Mocthogenes*, with the distal portion expanded and membranous and bent downwards and inwards through an acute angle beyond the spiny crest, which is here represented by an area of minute pilose setae. Extreme tip with two digitate terminal appendages and a minute, sharply pointed, colourless seta. Coxite very broad, with a conspicuous patch of setae on the inner aspect near

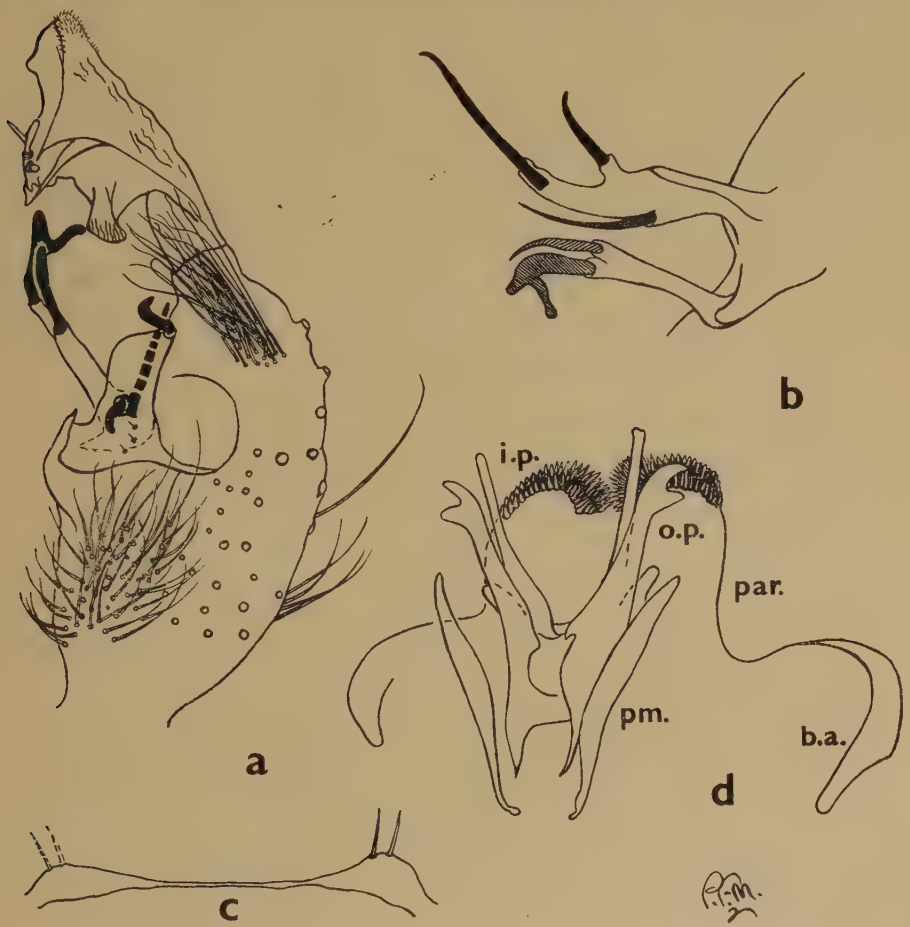

Fig. 1.—*Culex (Culex) nakuruensis* sp. n. Male terminalia. *a*, Coxite and style; *b*, sub-apical lobe of coxite from a different aspect; *c*, 9th tergite; *d*, phallosome and paraprocts; *b.a.*, basal arm of paraproct; *i.p.*, inner plate of phallosome; *o.p.*, outer plate of phallosome; *par.*, paraproct; *pm.*, paramere.

the base and another near the articulation of the style. The sub-apical lobe is strongly developed and very deeply cleft into a cylindrical arm, bearing a furcate and a simple, pointed spine, and a broad lobe with two very dark, strongly sclerotized spines arising from the inner edge and a more slender one arising from the outer edge. The outer surface of the coxite bears a number of very long setae similar to those found in *mirificus*. The outer division of the phallosome is expanded and concave at the tip, the inner simple. The

paraprocts are of the type normally found in the typical sub-genus with well-developed crown of spines and a comparatively short basal arm. The lobes of the 9th tergite are small and widely separated.

♀ *and early stages* unknown.

Breeding-places unknown. The allied *C. mirificus* was obtained from highly alkaline waters at the edge of Lake Nakuru (Hopkins, 1936).

References.

Edwards, F. W., 1913, Further notes on African Culicidae. *Bull. ent. Res.* **4**: 47–59.

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Hopkins, G. H. E., 1936, *Mosquitoes of the Ethiopian Region.* **1**. *Larval bionomics of mosquitoes and taxonomy of Culicine larvae.* London : British Museum (N.H.).

A NEW SPECIES OF *DIADELOPS* COLLIN (DIPTERA: ANTHOMYZIDAE) FROM FIJI.

By J. E. Collin, F.R.E.S.

The genus *Diadelops* was established in 1944 (*Ent. mon. Mag.* **80** : 265) upon a new British species found among the vegetation of a dried-up artificial pond in my garden at Newmarket, Suffolk. It was therefore somewhat surprising, and most interesting, to find that specimens of a very small Anthomyzid submitted to me for identification by Dr. van Emden of the Commonwealth Institute of Entomology represented a second species of the same genus from the Island of Fiji. These specimens not only possess the generic characters in structure and chaetotaxy of head and thorax of the type species, but are also remarkably similar in colour and size, differing mainly in shape, colour and venation of wings, and otherwise as stated below.

Diadelops distinctipennis sp. n. ♂♀.

♂.—Face with the same conical projection near middle, bearing immediately below its apex a pair of diverging up-curved bristles, as in type species (*delicata* Collin), and also similarly constricted opposite these bristles, but rapidly widening out below. Ciliation of arista still longer. Clypeus small, narrow and yellow. Chaetotaxy of head and thorax also similar to that of type, except that both of the down-curved bristles below each eye are longer, humeral bristle microscopic, and posthumeral bristle very small (though perhaps not made clear in the original description of the genus, the usual two notopleural bristles of *Anthomyza* are present, and there is in fact a small posthumeral bristle). Proboscis distinct, yellow, with rather long hairs beneath about base. Palpi apparently not developed.

Whole insect of a yellowish ground colour, with disc of thorax, scutellum and abdomen (including hypopygium which is smaller than in *delicata*) cinereous, all being somewhat dusted and rather dull. Lower half of pleurae, and legs, much more obviously yellow. Abdomen with first and second tergite more or less fused together, third and fourth subequal in length, fifth shorter, sixth very short, seventh (prehypopygial) longer on left side than on right. All the lateral membrane of abdomen, and often some sternites (or at least their hind margins), yellowish. Front femora with a conspicuously long, dark, posteroventral bristle rather more than one-third from tip, and another about half as long nearer tip, also a distinctive long bristle close to base of femur *behind*, followed by 2–3 others more dorsally placed. Hind tibiae with a somewhat darkened ring near base.

Wings long and narrow, greatest width about opposite outer crossvein (more than a half, but less than two-thirds from base of wing), and here rather more than one-quarter length of wing, axillary lobe (as in *Anthomyza*) very little developed, and alulae *very* narrow. Mediastinal vein abbreviated, almost hidden below subcostal, the latter ending at about one-quarter the length of wing, and well before middle of discal cell. Radial vein strongly arched, so that subapical cell at its widest part is quite twice width of cell above it, and ending slightly nearer to end of cubital than that is from end of discal vein. Cubital and discal veins closer together than any other of the long veins, and practically parallel throughout. Outer crossvein convex on outer side, and rather longer than last section of postical vein. Postical vein practically parallel with hind margin of wing. No distinct anal cell. Extreme base of wing somewhat clouded, and more or less distinct transverse

clouds on each side of middle crossvein, extending from just above cubital vein to hind margin of wing, also a similarly placed but longer apical cloud from just beyond outer crossvein to end of wing. End of each of the three veins at tip of wing also clouded. The transverse clouds are often more distinct when wing is viewed obliquely, and the three clear patches (at lower half of base of wing, and about each crossvein) then appear very distinctly whitish. All clouds are less distinct in immature specimens. Halteres with distinctly greyish knobs.

♀.—Very similar to male. Abdomen also with seven visible segments which are less unequal in length, and the ovipositor, with greyish-yellow cerci, usually lies flat within the end of the somewhat long and conical seventh segment. All tergites with narrow yellow hind margins.

Length about 1·25 mm.

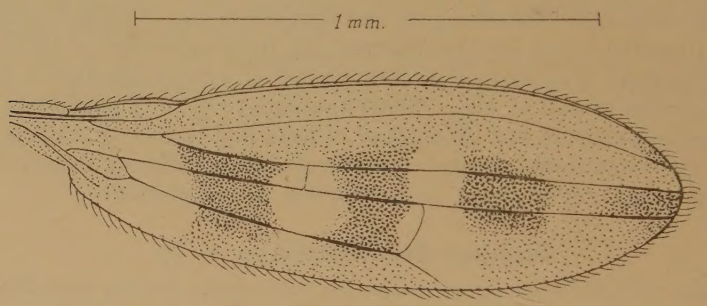

Fig. 1.—*Diadelops distinctipennis* sp. n. ♂.

A somewhat immature male was swept from Para Grass on 29th March, 1949, at Wainibokasi, Fiji, by Mr. B. A. O'Connor. This was accidentally damaged, but upon a request for additional material Mr. O'Connor sent seven males and five females taken in August, 1950, at Naduruloulou, Viti Levu, about five miles from the original locality, also by sweeping Para Grass, and an adjacent lawn upon which *Cyperus rotundus* was the predominant plant. Para Grass (*Brachiaria mutica* Staff.), a native of tropical America, is in Fiji the main pasture grass on alluvial flats in the wet zone, and is believed to have been introduced accidentally (*see* Parham, 1949, *Agric. J. Fiji* **20** : 15).

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